

Remarks

This is in response to the Office Action mailed on May 21, 2003. Claims 1 and 3-9 remain pending. Reconsideration and allowance of all claims are respectfully requested.

Preliminarily, Applicants' representatives wish to thank the Examiner for the courtesy extended during the interview of August 28, 2003. During the interview, claim 1 and Huber et al., U.S. Patent No. 5,938,003, were discussed. Applicants' representatives noted that Huber does not disclose a controllable second brake. The Examiner requested clarification as to the advantages associated with a controllable second brake, as opposed to a non-controllable brake. The remarks provided herein are consistent with the discussions held during the interview and provide a detailed description of the advantages associated with providing a controllable second brake.

Turning now to the Office Action, in section 1 of the Action, claims 1, 3, and 5-9 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Huber. This rejection is respectfully traversed.

Claim 1 is directed to a roller drive unit for conveying an object. Claim 1 recites a first controllable brake to slow down the drive roller to cause the lifting apparatus to lift the drive roller out of the retracted position into the raised position and to be completely opened during propelling of the object without slowing down the drive motor, as well as a second controllable brake to hold the lifting apparatus in the raised position. Claim 1 further recites that the first and second controllable brakes are electrically controllable.

In contrast, Huber discloses a roller drive unit in which a brake mechanism 90 is provided in addition to brake 70 (which acts on the lifting mechanism) and brake 80 (which acts on the drive shaft of the motor). The brake mechanism 90 is not a controllable brake and therefore continuously brakes the drive roller 30 (and thereby the driver motor 20) for enabling a lifting mechanism 40 to lift up the drive roller 30. See column 3, lines 62-65 of Huber (describing the light braking of the drive roller). The force generated by the lifting apparatus, and thus the force pressing the driver roller 30 against an object for propelling the object, depends on the braking momentum generated by the uncontrollable brake 90.

There are several disadvantages associated with the use of the uncontrollable brake 90 disclosed in Huber. These disadvantages are detailed in the previous response filed on May 5, 2003, and will not be repeated herein.

Likewise, there are distinct advantages to providing an electrically controllable second brake as recited by claim 1. For example, configuring the second brake as a controllable brake makes it possible to control the lifting momentum and, therefore, the force pressing the driving roller to an object to be conveyed. This can result in several distinct advantages, listed below.

- If a light object is to be conveyed, the device can be configured to not lift the object. In contrast, if an uncontrollable brake such as disclosed in Huber is used, the device would lift the object, which may result in an interlocking of the leading edge of the object with the rollers of the conveyor.
- If an object having a delicate or pressure-sensitive bottom is to be conveyed, braking can be controlled to minimize the possibility of damage to the object. In contrast, with use of an uncontrollable brake as disclosed in Huber, the braking cannot be controlled, and damage can therefore be caused to the object.
- If an object having a slippery bottom due to, for example, wetness or ice is to be conveyed, braking can be set to a maximum so that the entire force of the motor is used to press the driving roller against the bottom of the object being conveyed, thereby maximizing contact between the object and device. In contrast, with an uncontrollable brake as disclosed by Huber, lifting force may not be high enough to press the driving rollers through the film of water or ice.
- If it is desirable to hold an object in place, the first and second controllable brakes can be controlled independently to vary the momentum acting on the lifting cam and thereby to vary the force pressing the roller to the bottom of the object to be held in place. In contrast, using uncontrollable brakes as disclosed by Huber, both brakes have to be closed, resulting in no possibility to increase the elastic force pressing the driving roller to the bottom of the object.

In addition to the advantages noted above, controllable brakes can be preferable over uncontrollable brakes because wear on the brakes can be minimized. For example, when not needed the controllable first and second brakes of the present invention can be opened, resulting

in an increase in brake life. For example, it may only be necessary to close the brakes approximately 1-5% of the time, while the other 95-99% of the time allowing the brakes to remain open to prolong brake life. In contrast, with an uncontrollable brake as disclosed by Huber, the brake is continually closed 100% of the time, resulting in premature wear and failure of the brake.

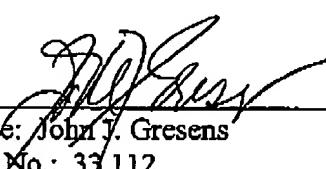
For at least these reasons, Huber fails to render obvious claim 1, as well as claims 3 and 5-9 that depend therefrom. Reconsideration and allowance are respectfully requested.

In section 2 of the Action, the Examiner noted that claim 4 would be allowable if rewritten in independent form. Applicants appreciate the Examiner's identification of allowable subject matter. All claims should now be in condition for allowance.

In view of the above amendments and remarks, claims 1, 3, and 5-9 are in condition for allowance. Reconsideration and allowance of all pending claims are respectfully requested. The Examiner is encouraged to contact the undersigned attorney at (612) 371-5265 with any questions concerning this application.

Respectfully submitted,  
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